



SLR-ST – 262

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**B.Sc. – III (Semester – VI) Examination, 2018
ELECTRONICS (CGPA Pattern) (Special Paper – XIV)
Measurement Instrumentation and Control System**

Day and Date : Wednesday, 4-4-2018
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

- Instructions:** 1) *All questions are compulsory.*
2) *Figures to the right indicate full marks.*
3) *Neat diagrams are drawn wherever necessary.*
4) *Use of log-table and calculator is allowed.*

1. Select the correct alternative of the following : 14
- 1) The _____ is the feature of open loop control system.
 - a) simple to design and construct
 - b) economical and easy to maintenance
 - c) no relation between input and output
 - d) all of these
 - 2) The frequency of the bioelectrical signals is
 - a) low
 - b) high
 - c) moderate
 - d) can not say
 - 3) The _____ programming language is mostly preferable for PLC programming.
 - a) ladder diagram
 - b) C
 - c) basic
 - d) none of these
 - 4) The _____ is the essential component of the digital storage oscilloscope.
 - a) amplifier
 - b) sample and hold
 - c) oscillator
 - d) active filter
 - 5) The fidelity is the degree to which the control system shows the changes in the measured variable without any _____ error.
 - a) systematic
 - b) static
 - c) dynamic
 - d) gross

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- 6) The frequency generator employs _____ to produce the frequency.
a) differentiator b) integrator c) both a and b d) amplifier
- 7) In case of PD control system the output of the controller is linearly proportional to the
a) the input error signal
b) rate of change of the input error signal
c) both a and b
d) average change of the input error signal
- 8) The memory unit of the PLC can utilize the _____ type of the memory.
a) volatile b) non-volatile
c) volatile or non-volatile d) static
- 9) The instrument used to detect the electrical activity of the heart of human body is
a) EMG b) ECG c) EEG d) EOG
- 10) The _____ control system has control over the output signal.
a) open loop b) closed loop c) automatic d) both b and c
- 11) In case of DMM, to measure the value of unknown resistance the _____ source is utilized.
a) constant voltage b) constant current
c) variable voltage d) variable current
- 12) In the action state the bio-potential generated is
a) +70 mV b) – 20 mV c) + 20 mV d) – 70 mV
- 13) The standard glass pH electrode is of _____ electrode
a) potentiometric b) amperometric
c) variable capacitive d) variable inductive
- 14) The _____ is used for non-invasive diagnosis.
a) pulse oximeter b) ultrasound imaging
c) heart rate monitor d) all of these



2. Solve **any seven** from the following : **14**
- 1) Explain the any two characteristics of control system.
 - 2) State the salient feature of the PLC.
 - 3) Give the frequencies of the EEG signal.
 - 4) Compare the open loop and closed loop control system.
 - 5) Draw the block diagram of heart rate measurement system.
 - 6) Give the advantage and disadvantage of the PI control system.
 - 7) Enlist various symbols used in the ladder diagram.
 - 8) Explain the importance of time base generator in CRO.
 - 9) Draw the block diagram of DMM.
3. A) Solve **any two** of the following : **10**
- 1) Explain the resting and action potentials.
 - 2) What is pH and explain the pH meter with the help of block diagram.
 - 3) Explain in detail automatic control system with its classification.
- B) Explain the basic digital control system. **4**
4. Solve **any two** of the following : **14**
- 1) Explain the LCR-Q meter with the help of block diagram.
 - 2) Explain the architecture of the PLC with diagram.
 - 3) Explain the Robotics arm control system in detail.
5. Solve **any one** of the following : **14**
- 1) a) Explain in detail the ECG recorder with block diagram.
b) Explain the ON-OFF temperature control system for a set point.
 - 2) Explain the Digital Storage Oscilloscope (DSO). Give the advantages of DSO over analog one.

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